

1   **WHAT IS CLAIMED IS:**

2           1. A packaging method for thin integrated circuits comprising:  
3              forming a circuit layer with multiple sections on a substrate;  
4              attaching at least one electronic element to the circuit layer to  
5      connect two sections of the circuit layer;  
6              applying an encapsulant layer to protect the electronic elements; and  
7              removing the substrate to expose the circuit layer.

8           2. The packaging method as claimed in claim 1, wherein multiple  
9      dimples are defined in the substrate before the circuit layer is formed on the  
10     substrate and in the dimples;

11           whereby, the circuit layer at the dimples become protrusions after the  
12     substrate is removed.

13           3. The packaging method as claimed in claim 1, wherein the  
14     substrate has a flat top face and the circuit layer formed on the substrate is  
15     flat.

16           4. The packaging method as claimed in claim 1, wherein the at least  
17     one electronic element is connected to the circuit layer by bonding metal  
18     wires between the at least one electronic element and the circuit layer.

19           5. The packaging method as claimed in claim 2, wherein the at least  
20     one electronic element is connected to the circuit layer by bonding metal  
21     wires between the at least one electronic element and the circuit layer.

22           6. The packaging method as claimed in claim 3, wherein the at least  
23     one electronic element is connected to the circuit layer by bonding metal  
24     wires between the at least one electronic element and the circuit layer.

1           7. The packaging method as claimed in claim 1, wherein the at least  
2       one electronic element is connected to the circuit layer by tin balls between  
3       the at least one electronic element and the circuit layer.

4           8. The packaging method as claimed in claim 2, wherein the at least  
5       one electronic element is connected to the circuit layer by tin balls between  
6       the at least one electronic element and the circuit layer.

7           9. The packaging method as claimed in claim 3, wherein at least one  
8       the electronic element is connected to the circuit layer by tin balls between  
9       the at least one electronic element and the circuit layer.

10          10. The packaging method as claimed in claim 1, wherein parts of  
11       the substrate are retained after etching, are bent and serve as a gull-winged  
12       lead frame.

13          11. The packaging method as claimed in claim 2, wherein parts of  
14       the substrate are retained after etching, are bent and serve as a gull-winged  
15       lead frame.

16          12. The packaging method as claimed in claim 3, wherein parts of  
17       the substrate are retained after etching, are bent and serve as a gull-winged  
18       lead frame.

19          13. The packaging method as claimed in claim 1, wherein an  
20       isolating layer is applied between adjacent sections of the exposed circuit  
21       layer after the substrate is removed, wherein the isolating layer reflects light.

22          14. The packaging method as claimed in claim 1, wherein the at least  
23       one electronic element is a light emitting diode.

24          15. The packaging method as claimed in claim 14, wherein an

- 1 isolating layer is applied between adjacent sections of the exposed circuit
- 2 layer after the substrate is removed, wherein the isolating layer reflects light.

3           16. The packaging method as claimed in claim 1, wherein after  
4 removing the substrate, the packaging method further comprises:

5           attaching at least one bottom electronic element under the exposed  
6 circuit layer; and  
7           applying a bottom encapsulant layer to protect the at least one  
8 electronic element.